Effects of Caffeine on *Fusobacterium nucleatum* biofilm treated with Nicotine.

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Abstract:

Fusobacterium nucleatum is a subgingival bacteria that is associated with periodontal disease. In general, smokers tend to have a higher risk of periodontal disease and increased cavities along with greater chance of atherosclerosis, which can cause blockage leading to a heart attack or stroke. The objective of this study was to determine the effects of caffeine on *F. nucleatum* biofilm formation treated with various concentrations of nicotine (0-32 mg/ml). Nicotine is found in cigarettes and this experiment examined if caffeine will inhibit the growth of biofilm with nicotine. Various concentrations of nicotine were used ranging from 0-32 mg/ml. Total absorbance was measured using a spectrophotometer and revealed that caffeine at a concentration of 8 mg/ml significantly inhibited the formation of biofilm at nicotine concentrations of 0.25-8 mg/ml. Biofilm formation was significantly higher when caffeine was not present. Biofilm is commonly found in the mouth and is responsible for biofilm production on teeth leading to dental plaque deposits which become tarter. Simply brushing will not remove tarter and if left untreated it can cause periodontal gum disease. Caffeine-containing beverages may be beneficial in preventing *F. nucleatum* biofilm formation in smokers.

Support partially provided by the IUPUI UROP program